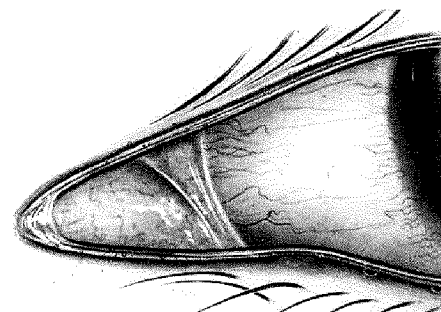
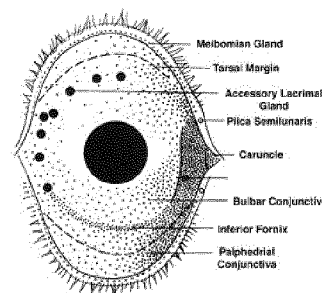


The conjunctiva is a thin, transparent mucous membrane, lining the inner surface of the eyelids (**Palpebral conjunctiva**) and reflected (**Fornix**) to cover the anterior portion of the globe (**Bulbar conjunctiva**). When the lids are closed it forms the conjunctival sac.

Gross anatomy

1. **Palpebral conjunctiva:** Lining the posterior surface of the lids and firmly adherent to the underlying tarsus.
2. **Fornices:** That part which is reflected between the lids and the globe. Formed of superior, inferior, medial and lateral fornices.
3. **Bulbar conjunctiva:** Covering the anterior portion of the globe. Loosely adherent to the episcleral tissue & tenon's capsule, except at the limbus.
4. **Plica semilunaris:** Delicate, vertical crescent-shaped conjunctival fold at the medial canthus.
5. **Caruncle:** Small red structure at the medial canthus, with certain skin characteristics, including fine hairs & sebaceous glands.



Minute anatomy

1. **Epithelial layer:** 2-5 layers of Non-keratinized stratified squamous epithelium. This layer contains the mucin-secreters and minor lacrimal glands.
2. **Substantia propria:** Superficial adenoid & deep fibrous layer:
 - Adenoid layer: Fine connective tissue rich in lymphocytes with no true lymphoid follicles. This layer develops at the age of 3 months (*Not present at birth*).
 - Fibrous layer: Thick layer of connective tissue, containing the nerves and vessels of the conjunctiva.

Manifestations of conjunctival inflammations

1. **Irritation:** Discomfort, itching, burning & FB sensation.
2. **Discharge** (Serous, mucoid, purulent....etc): According to the etiology & severity.
3. **Chemosis:** Edema of the subepithelial connective tissue.

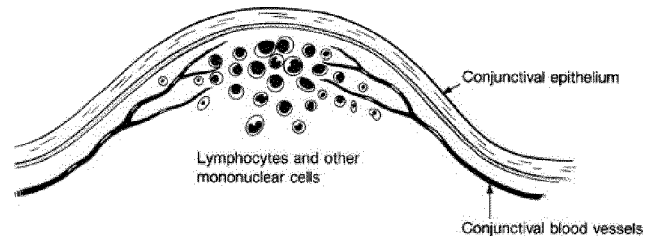
4. Hyperemia: Conjunctival injection due to dilatation of the posterior conjunctival vessels $\Rightarrow$ Appears sweeping from the fornices.

5. Follicles: Focal collections of lymphocytes in the substantia propria of the conjunctiva. Caused by:

a. Viral infections e.g. adenovirus, herpes....etc.

b. Chlamydia: Trachoma & inclusion conjunctivitis.

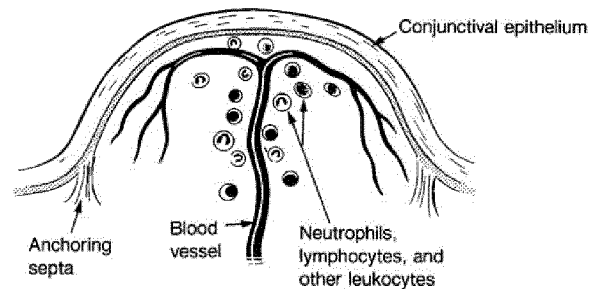
c. Drug reactions e.g. atropine & glaucoma medications.



6. Papillae: Non-specific response to chronic irritation $\Rightarrow$ Epithelial irritation with vascular core. Its size is restricted by fibrous septae attaching the conjunctiva to the underlying tarsus. Caused by:

a. Chronic infections.

b. Allergy.

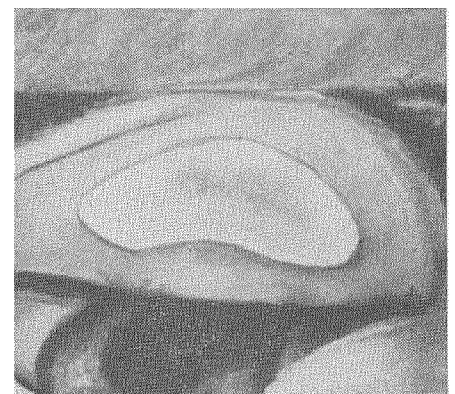


7. Giant papillae: In severe & chronic inflammation, these septae rupture & the papillae coalesce to form giant papillae. Caused by:

a. Prolonged contact lens wear (Giant papillary conjunctivitis).

b. Vernal Keratoconjunctivitis (Spring catarrh).

8. Membranes: Damage of the conjunctival vessels & epithelial surface by severe inflammation $\Rightarrow$ Exudation of fibrin, inflammatory cells, necrotic cells & serous fluid $\Rightarrow$ Dirty grayish membrane. Removal of a membrane leaves a raw, bleeding surface, this may cause adhesions between different parts of

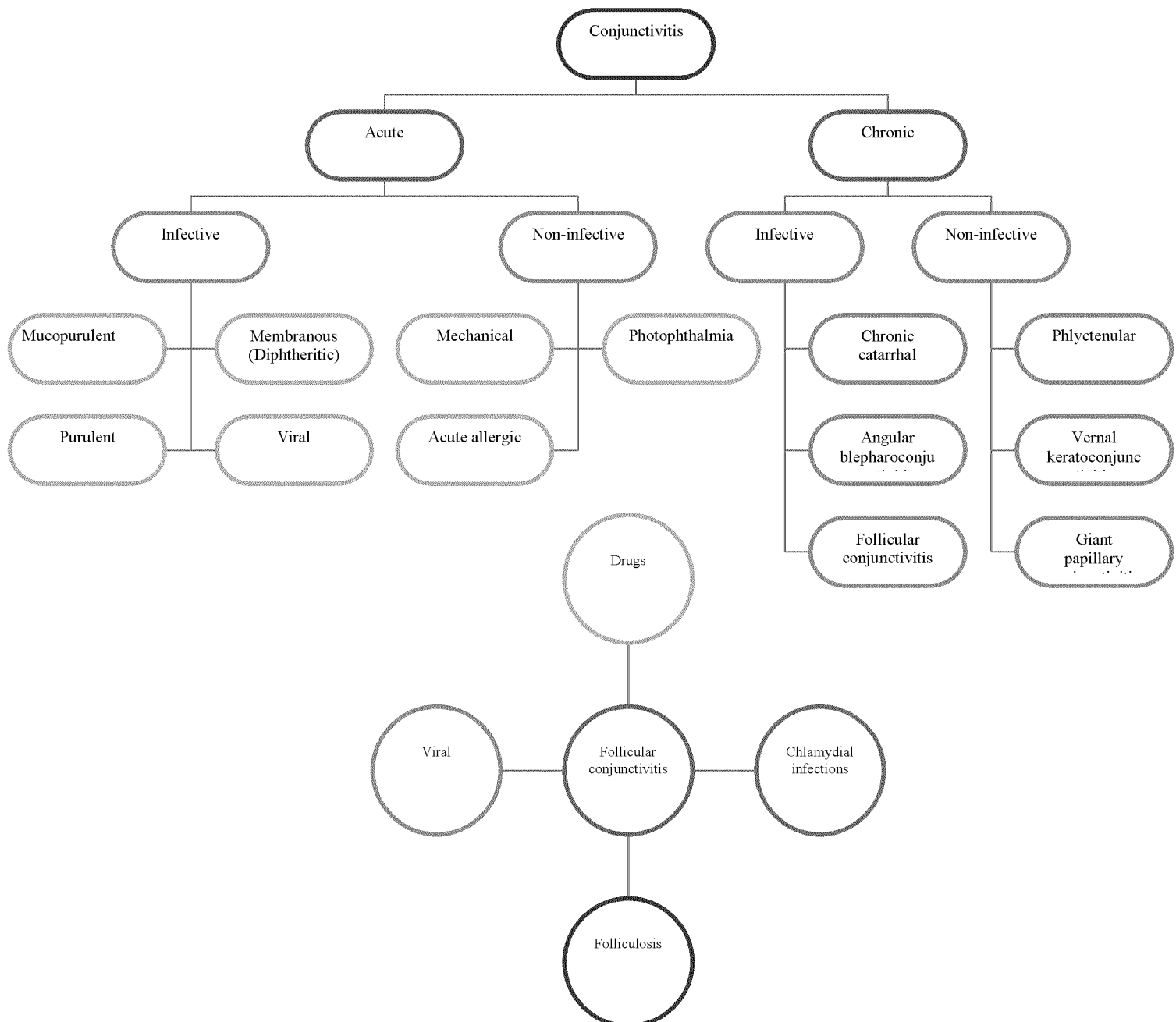


the conjunctiva or between the conjunctiva & cornea (Symblepharon). Caused by:

- a. Diphtheritic conjunctivitis.
- b. Alkali or acid burns.
- c. Severe viral infections.

9. **Pseudomembranes:** Condensation of discharge & exudates over the conjunctival surface. They are easily removed leaving an intact epithelial surface.

Inflammations of the conjunctiva (*Conjunctivitis*)



Acute infective conjunctivitis

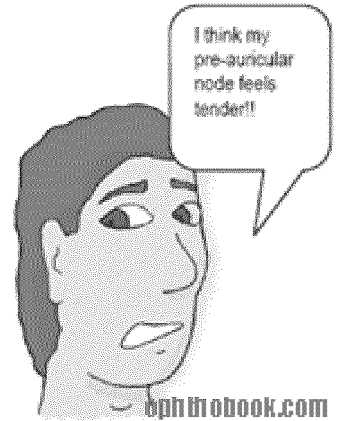
A. Mucopurulent conjunctivitis (MPC)

Causative organisms

- a. Haemophilus aegypticus (Koch-Week's bacilli).
- b. Staphylococci, streptococci & pneumococci.

Clinical picture

1. Burning sensation: irritation & lacrimation.
2. Hyperemia of the conjunctiva.
3. Conjunctival chemosis.
4. Mucopurulent discharge: Mucous, tears, leucocytes, serum & epithelial cell debris.
5. Gluing of the eyelids, especially at the morning.
6. Lid edema.
7. Petechial subconjunctival haemorrhage in severe cases.



Fate

- a. Spontaneous cure or after treatment.
- b. Chronicity.
- c. Corneal ulcers: ⁽¹⁾Superficial, ⁽²⁾crescentic & ⁽³⁾marginal.

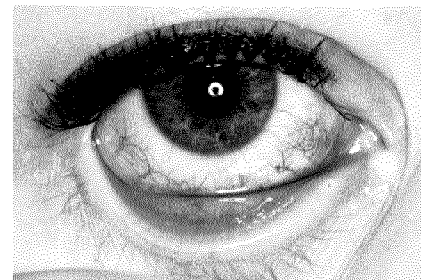
Management

1. Prevention:

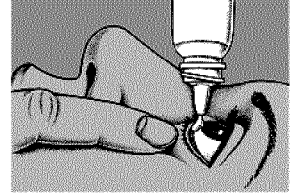
- a. Combat flies.
- b. Good personal hygiene.
- c. Protect the fellow eye, in persons with unilateral MPC.
- d. Protect contacts: Using separate towels which should be boiled.

2. Curative:

- a. Sterile water or boric acid 4%: **Frequent washing**, to remove the discharge.
- b. Hot fomentation.



- c. Local **antibiotic** eye drops: Used frequently during the day:
- Koch-Week's bacilli $\Rightarrow$ sulfacetamide.
 - Staph., Strept. & Pneumococci $\Rightarrow$ broad spectrum antibiotics.
- d. Local **antibiotic** eye ointment: At night.
- e. Systemic **antibiotics**: In severe cases.
- f. Sun glasses in cases with photophobia, as **bandage is contraindicated**. Bandage prevents free exit of discharge, allowing more multiplication of the organism.



B. Purulent conjunctivitis

Causative organism

- a. Gonococci: 60-80% of cases.
- b. Staph., Strept. & mixed infection.

Route of infection: ⁽¹⁾Flies, ⁽²⁾dust, ⁽³⁾contaminated towels, ⁽⁴⁾through genitals & ⁽⁵⁾through the birth canal during delivery.

Classification

1. Ophthalmia neonatorum.
2. Adult type.

Clinical picture & stages

1. **Incubation period:** Few hours to 3 days.
2. Stage of **infiltration:**
 - a. **Eyelids:** edema & tenderness.
 - b. **Conjunctiva:** Marked chemosis & hyperaemia.
 - c. **Discharge:** Watery or mucoid.
 - d. May be: **Enlarged tender preauricular lymph nodes.**
3. Stage of **discharge:**
 - a. $\Downarrow$ lid edema, however **tense & may be painful.**
 - b. $\Downarrow$ conjunctival edema.
 - c. **Hyperemia & papillae formation.**
 - d. **Profuse purulent discharge.**

Fate & complications

1. Spontaneous cure or after treatment.
2. Chronicity.
3. Corneal ulcers: Central, marginal or ring ulcers.
4. Iridocyclitis.

Management

1. Prevention:

- Good personal hygiene & healthy sexual habits.
- Protect the fellow eye.
- Protect contacts: by using separate towels which should be boiled.
- Prevention of purulent ophthalmia neonatorum.

2. Curative:

- Sterile water or boric acid 4%: **Frequent washing**, to remove the discharge.
- Local **antibiotic** eye drops (Broad spectrum): The frequency of application depends on the severity, but it may be applied:
 - Every 5 minutes for an hour, then
 - Every hour for 48 hours, then
 - 4 times/ day for the following 10 days.
- **Antibiotic** ointment at night.
- Systemic **antibiotics**: In gonococcal cases, give single IM injection of cefotriaxone.
- Local **atropine**: In corneal involvement &/or iritis.
- Dark glasses: To relieve photophobia.
- Bandage is contraindicated.

Ophthalmia nenatorum (Neonatal ophthalmia)

Definition: Any form of conjunctivitis occurring in the first month of life. One of the most severe forms of ophthalmia neonatorum is the purulent type, caused by gonococci.



Etiology

1. Infectious ophthalmia neonatorum:

- Bacterial: Gonococci (Gonococcal "Purulent" ophthalmia neonatorum), Staph., Strept. & Pneumococci.
- Viral: Herpes simplex & Adenoviruses.
- Chlamydia.

2. Non-infectious ophthalmia neonatorum (Chemical): Due to prolonged postpartum instillation of drops or ointment as a prophylaxis against infectious ophthalmia neonatorum.

Diagnosis

- Any discharge from the eyes of a newborn has to be seriously examined as tears are not secreted at this early time. The condition should be also differentiated from congenital dacryocystitis (Usually unilateral with regurge of pus).
- Diagnosis of ophthalmia neonatorum is carried out mainly by the clinical picture, however any of the following may be helpful:
 - a. **Conjunctival smears:** Demonstrate bacteria, inclusion bodies in chlamydial cases & Lipschutz inclusions in herpetic cases.
 - b. **Immunofluorescent tests:** In cases of Chlamydia.
 - c. **Herpes culture.**

Management

1. Prevention:

- Treatment of the mother from herpetic cervicitis before delivery.
- Washing of the baby's face & body from above downwards.
- Penicillin or any other broad spectrum antibiotic eye drops: Used after birth and up to a week. Prolonged use should be avoided to prevent chemical ophthalmia neonatorum.



2. Curative treatment:

- **Frequent wash** & removal of the discharge.
- Local **antibiotic** eye drops (*Frequent use*).
- Local **antibiotic** eye ointment (*As frequent as possible*).
- Systemic **antibiotics** in severe cases.
- Local **atropine** in cases with corneal affection.

C. Membranous conjunctivitis (*Diphtheritic*)

It is a rare condition, due to effective immunization against *C. diphtheriae*. This disease affects only the non-immunized children.

Causative organism: *Corynebacterium diphtheriae*.

Clinical picture (Stages)

1. **Incubation period:** 12 hours to 3 days.
2. Stage of **infiltration:** 5 to 10 days:
 - **Lid:** Edema, redness, tenderness & induration (Wood-like).
 - **Conjunctiva:** edema & yellowish exudate.
 - **Discharge:** Scanty mucopurulent.
 - **True membrane:** Grayish yellow, patchy or covering the whole palpebral conjunctiva.
3. Stage of **discharge:**
 - Marked **conjunctival hyperemia**.
 - Purulent, blood-stained **discharge**.
 - Removal of the membrane leaves a septic granulation tissue, exuding thick yellow pus.

Fate & complications

1. **Local complications:** **Cicatrization** (Irreversible effect):
 - **Eyelids:** Trichiasis, entropion & symblepharon.
 - **Lacrimal system:** Fibrosis of the lacrimal ducts & the accessory lacrimal glands ⇒ xerosis.

- **Conjunctiva:** Xerosis, symblepharon & pseudopterygium.
- **Cornea:** Ulcers, xerosis & vascularization.

2. General complications:

- **Heart:** Toxic myocarditis & heart failure.
- **Lungs:** Respiratory failure.
- **Kidney:** Toxic nephritis & albuminuria.
- **Neuropathy**, especially of the motor nerves: Paralytic squint & paralysis of accommodation (+ other systemic neurological symptoms).

Management

1. Preventive:

- Immunization.
- Isolation of patients.

2. Curative:

- Complete bed rest (For fear of myocarditis & heart failure).
- Anti-diphtheritic serum: 40000-60000 units IM.
- Systemic IM penicillin injection.
- Local antibiotic eye drops.
- Local anti-diphtheritic serum.
- Local antibiotic ointment ⇒ prevent symblepharon.
- Local atropine ointment in cases with corneal affection.

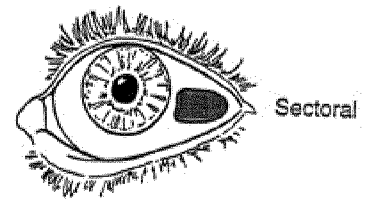
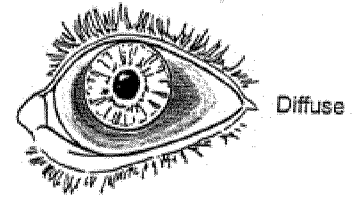
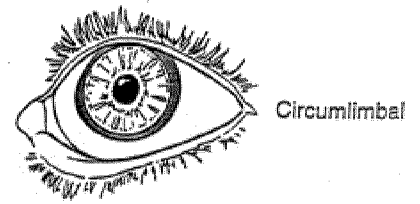
D. Viral conjunctivitis

Causative agents

- **Adenoviruses:** Spreads by droplet infection. It causes Epidemic Kerato-Conjunctivitis (EKC).
- Herpes simplex, Enterovirus & Newcastle disease virus.
- Acute viral fevers: Measles, influenza & mumps may be associated with conjunctivitis.

Clinical picture

1. Conjunctiva:
 - Hyperemia
 - Edema
 - Conjunctival follicles.
 - Subconjunctival haemorrhage
2. Enlarged, tender preauricular lymph nodes
3. Discharge: Watery (*May be purulent or mucopurulent*).
4. Punctate epithelial keratitis (*In cases of EKC*).
5. Photophobia.
6. Lid vesicles in herpetic cases.



Fate: Self-limited condition resolving in 7-14 days. With poor hygienic measures, affection of the fellow eye occurs few days later.

Management

1. Prevention: (*As in MPC*).
2. Curative:
 - Cold compresses.
 - Artificial lubricants.
 - In herpetic cases: Topical trifluridine or acyclovir. Oral acyclovir can be used.
 - Local atropine in cases with corneal affection.

Chronic infective conjunctivitis

A. Chronic catarrhal conjunctivitis

Etiology:

1. Sequelae of acute conjunctivitis.
2. chronic irritation with wind, smoke or heat.
3. Local irritation with rubbing lashes, PTDs.... etc.
4. Uncorrected errors of refraction.

Clinical picture:

1. Irritation, discomfort, itching, burning & foreign body sensation.
2. Little discharge.
3. Hyperemia of the fornices.

Treatment:

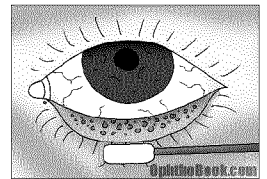
1. Remove the cause.
2. Astringent & vasoconstrictor eye drops.

B. Angular blepharo-conjunctivitis

C. Follicular conjunctivitis

Conjunctivitis with follicles formation:

1. **Chlamydia**: Trachoma & adult inclusion conjunctivitis.
2. **Viral Infections**:
 - Follicles are more in the inferior fornix.
 - Free cornea.
 - No scarring.
3. **Conjunctivitis medicamentosa**:
 - History of drug use (*Atropine, epinephrine, glaucoma medications & topical antibiotics*).
 - Itching.
 - **Follicles in the inferior fornix.**
 - Rapid cure, once the drug is stopped.
4. **Folliculosis**: Affecting children. Bilateral noninflammatory conjunctival follicular hypertrophy.

**Trachoma (*Granular ophthalmitis*)**

The major cause of blindness in many developing countries.

Definition: Chronic infectious follicular keratoconjunctivitis, characterized by:

1. Subepithelial cellular infiltration.
2. Follicles & papillae.
3. Pannus formation.
4. Healing by fibrosis.

Etiology

Causative organism: Chlamydia trachomatis:

- Large-sized, obligate intracellular organism.

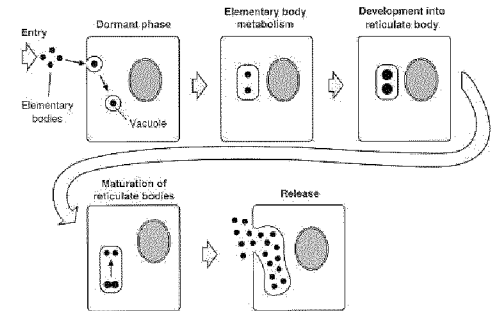
- Contains both DNA & RNA.
- Has a cell wall.
- Susceptible to antibiotics (Erythromycin, tetracycline & sulfa).
- Recurrence is common, as it leaves no solid immunity.

Mode of transmission: Conjunctival discharge.

Predisposing factors: Low socioeconomic & endemic areas.

Pathology

- C. trachomatis is epitheliotropic.
- The elementary body (*Core of DNA, surrounded by a protein cover*) enters the conjunctival cells by endocytosis.
- Division occurs inside the cell, forming the inclusion body (*Many elementary bodies*).
- The cell ruptures, releasing its content of the elementary bodies, which infects new cells & repeat the cycle (*Each cycle taking around 24 hours*).



Clinical picture

1. MacCallan's classification:

- **T_I:** On infection, there is cellular infiltration around the invading organism → formation of ⁽¹⁾subepithelial, ⁽²⁾small pin-point, ⁽³⁾grayish follicles, ⁽⁴⁾with a centre of mononuclear cells, surrounded by lymphocytes & multinuclear giant cells (*Leber's cells*) These follicles are ⁽⁵⁾not raised above the surface, non-⁽⁶⁾expressible & immature. Inclusion bodies can be detected in conjunctival scrapings by Giemsa stain.
- **T_{IIa}:** ⁽¹⁾Enlarged, ⁽²⁾pinkish follicles. They become ⁽³⁾expressible & ⁽⁴⁾raised above the surface.
- **T_{IIb}:** Papillae formation due to increased filtration around a core of blood vessels. The papillae are ⁽¹⁾soft, ⁽²⁾vascular & ⁽³⁾pinkish.

- **Tiii:** Healing occurs by cicatrization, which may take the form of lines, patches, or dense white line at the sulcus subtarsalis called Arlt's line. Post-trachomatous degenerations (PTDs) occur in between the adjacent papillae or in the deeper parts of the papillae. These PTDs may be calcified $\Rightarrow$ Sandy white calcified spots (PTCs).
- **Tiv:** The cicatrization is complete, with no follicles or papillae and no inclusion bodies in the conjunctiva.

2. **Corneal manifestations:** *Causing pain, lacrimation, photophobia & blepharospasm:*

- **Superficial keratitis:** Numerous epithelial erosions, involving the upper part of the cornea.
- **Corneal follicles:**
 - Small rounded grayish infiltration areas in the upper cornea.
 - Herbert's rosettes: Subepithelial lymphoid infiltrations.
 - Herbert's pits: Healing of Herbert's rosettes leaves depressed pits $\Rightarrow$ serrated appearance of the lower edge of the pannus.
- **Trachomatous pannus:** Superficial vascularization & infiltration of the upper cornea.
 - Blood vessels run subepithelially, between the corneal follicles.
 - Course:
 - a. Progressive pannus: Parallel vessels running vertically downward to a level forming a horizontal line. Infiltration precedes vascularization.
 - b. Regressive pannus: Regression of infiltration & narrowing of the Bl. vessels.
 - c. Healed pannus: Superficial scar is formed, with fine obliterated vessels.



- Fate:
 - a. Complete resolution with clear cornea: If the basement membrane is not destroyed.
 - b. Pannus siccus (Permanent opacity): If the basement membrane is destroyed.
- Differential diagnosis:

	Trachomatous pannus	Phlyctenular pannus	Leprotic pannus	Degenerative pannus
Cause	C. trachomatis infection	Allergic	Lepra bacilli	Degeneration
Site	Upper cornea	Any site		
Border	Serrated & horizontal	Rounded	Irregular	
Infiltration & vessels	Variable	Thin & very vascular	Irregular, deep with few vessels	Fibrous tissue
Association	Follicles, papillae, irritation	Phlycten, marked irritation	Iritis, corneal anaesthesia & other manifestations of leprosy	Absolute glaucoma

- **Corneal ulcers:**

- Typical trachomatous ulcer: Superficial, linear, horizontal ulcers, at the lower edge of the pannus, which are chronic, slowly spreading & healing by facet formation. Secondary infection is uncommon.
- Marginal or central ulcers: Unrelated to the pannus.
- Ulcers due to complications of trachoma.

- **Xerosis:**

- Goblet cells atrophy.
- Lacrimal ducts obstruction.
- Lacrimal gland fibrosis.

- **Keratectasia:** Being weakened by trachoma, the cornea may bulge forwards.

Sequelae & complications

1. Lids:

- Ptosis:
 - a. Mechanical: Due to heaviness of the cellular infiltrate.
 - b. Fibrosis or weakness of Muller's muscle.
- Trichiasis: Due to local scarring around the lid margin.
- Cicatricial entropion: due to conjunctival shrinkage.
- Chronic meibomianitis.

2. Conjunctiva:

- Posterior symblepharon: Adhesions in the fornices.
- Xerosis.
- Hyaline & amyloid degeneration of the upper tarsus & conjunctiva.
- Pigmentation.

3. Lacrimal system:

- Obstruction of puncti by fibrosis.
- Chronic canaliculitis with epiphora.
- Chronic dacryocystitis.
- Chronic dacryoadenitis.

4. Corneal complications: (*corneal manifestations*).

Diagnosis

1. Clinical sure signs:

- Expressible follicles.
- Arlt's line.
- Pannus + Herbert's pits.
- PTDs.

2. Intracytoplasmic basophilic inclusion bodies: In conjunctival scrapings stained with Giemsa stain.

3. Immunologic tests.

Differential diagnosis

1. Follicles of trachoma: From other causes of follicles.
2. Papillae of trachoma: Other causes of papillae, especially spring catarrh.
3. Trachomatous pannus: From other causes of pannus.

Prevention

1. Combat flies.
2. The patient must use separate towels that must be boiled.
3. Careful disinfection of infected fingers.

Treatment

1. Medical ttt:

- Frequent local sulfa or broad spectrum antibiotic (Tetracycline or erythromycin) eye drops for 6-12 weeks.
- Local atropine in cases with corneal involvement.
- Systemic sulfonamide, tetracycline or erythromycin.

2. Surgical ttt: *Accompanying medical ttt:*

- Expression of follicles.
- Scraping of papillae.
- Picking of PTDs.

Inclusion conjunctivitis

Etiology: Infection with Chlamydia trachomatis type D.

Mode of infection:

- Transmitted by fingers from genitals.
- Transmitted from water of swimming pools (Swimming pool conjunctivitis).

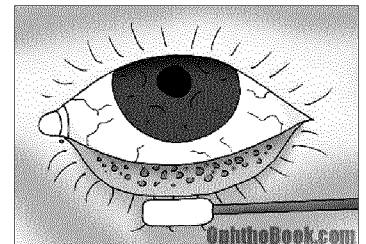
Clinical picture:

- Lower lid follicles.
- Superficial punctate keratitis.
- Associated urethral or vaginal discharge.

Fate: Spontaneous healing within 3-12 months.

Treatment:

- Sulfa or broad spectrum antibiotic eye drops & ointment.
- Systemic sulfonamide, tetracycline or erythromycin.



Acute non-infective conjunctivitis

1. **Mechanical injury:** Due to general irritation with dust, smoke, wind, heat, physical or chemical agents & even self-inflicted.

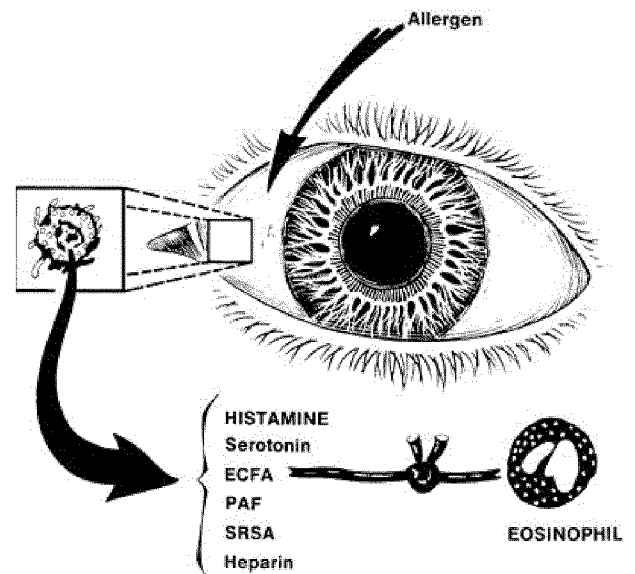
2. **Photophthalmia:**

- Due to ultraviolet rays as in welding arcs & during skiing.
- Clinical picture: (*Within 4-6 hours.*)
 1. Irritation, photophobia, burning, pain & blepharospasm.
 2. Watery or mucoid discharge.
 3. Hyperemia.
 4. Punctate corneal erosions.

3. **Acute allergic conjunctivitis:** Type I hypersensitivity.

Clinical picture: (*Within minutes after exposure.*)

1. Itching & eyelid swelling & conjunctival hyperaemia.
2. Watery or mucoid discharge.
3. Edema of the lids & chemosis.



Treatment of acute non-infective conjunctivitis:

1. Remove the cause.
2. Astringent & vasoconstrictor eye drops.
3. Cold compresses.
4. Artificial lubricants.
5. Non-steroidal anti-inflammatory drugs.
6. Antiallergics.
7. Topical steroids.

Chronic non-infective conjunctivitis

1. Phlyctenular conjunctivitis

Definition: Nodular affliction characterized by the formation of a small, circumscribed lesion at the corneal limbus.

Etiology: Hypersensitivity to an endogenous antigen (*Type IV hypersensitivity reaction*):

1. **Tubeculo-protein:** *The tubercle never found in the phlyctenular lesion itself.*
2. Staphylococcal blepharoconjunctivitis (*S. aureus*)
3. Intestinal parasites.
4. Septic focus.

Symptoms

1. Irritation, discomfort, burning & foreign body sensation.
2. Watery or mucoid discharge. (*mucopurulent discharge with sticking of the lids may be described if 2ry bacterial infection occurs*).
3. Photophobia & blepharospasm in cases with corneal affection.

Signs

1. Phlycten:
 - Rounded, raised nodule. 1-3mm in size.
 - Grayish or yellowish.
 - Common at the limbus & bulbar conjunctiva & rare on the palpebral conjunctiva.
 - Formed of lymphocytic aggregation, covered with intact epithelium. It ulcerates on secondary infection.
 - Surrounded by a small area of congestion.
2. Corneal manifestations.
 - Corneal phlycten: It may be superficial or under Bowman's membrane.

- Phlyctenular ulcers:
 - Limbal: Single or multiple. May fuse ⇒ ring ulcer.
 - Fascicular: Superficial ulcer, creeping in a serpiginous manner towards the centre & supplied by a leash of Blood vessels. On healing, it leaves maximum opacity where it stops.
- Phlyctenular pannus: Affecting any part of the limbus:
 - Thin & vascular with marked irritation.
 - Straight vessels, which are deep to Bowman's membrane.
 - Infiltration & vascularization with a rounded edge.

Complications

1. Potentially blinding disease, before advent of steroid therapy.
2. Corneal scarring & visual impairment.
3. Corneal perforation (Very rare).

Differential diagnosis

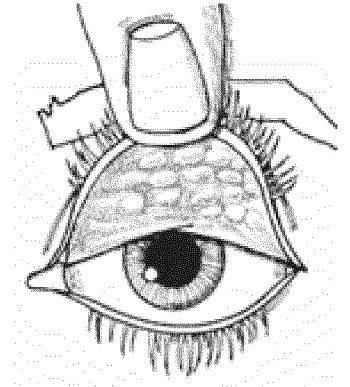
1. Bulbar spring catarrh.
2. Episcleritis.
3. Inflammed pinguecula.
4. Acne rosacea.
5. Phlyctenular pannus: *(From other types of pannus).*

Treatment

1. ttt of the cause of allergy if possible:
 - Evaluation & ttt of TB.
 - Evaluation of the lid for evidence of chronic staphylococcal infection & ttt.
2. Topical steroids.
3. Local atropine in cases with corneal involvement.
4. Topical astringents.
5. Local antibiotics in cases with secondary infection.
6. Dark glasses.
7. Fascicular ulcer: Cauterized with carbolic acid, then actual cautery for the feeding blood vessels at the limbus.

2. Spring catarrh (Vernal *kerato-conjunctivitis*)

Definition: Chronic allergic condition of the conjunctiva, affecting mainly children & young adults. Characterized by seasonal variation & may be associated with keratoconus. It is caused by hypersensitivity to airborne allergens. It is common in patients with asthma, hay fever or atopy.



Types of spring catarrh

1. Palpebral type:

- Large flat-topped papillae, giving a cobblestone appearance on the tarsus & absent from the fornix, affecting mainly the upper tarsus.
- Papillae: Bluish-white or red, formed of central core of fibrous tissue, rich in eosinophils & covered by thick epithelium. The centre & edges show tiny twigs of Bl. vessels.
- On lid eversion: The papillae are covered by sticky, milky white film of discharge rich in eosinophils.

2. Bulbar type: (More severe)

- Gelatinous limbal masses formed of hypertrophied epithelium with CT core & hyaline degeneration.
- Usually starting at the upper limbus, then later all around.
- White spot secretions of eosinophils & necrotic epithelium may be seen (**Tranta spots**).

3. Mixed type: Mixture of palpebral & bulbar type.

Symptoms

1. Itching & lacrimation.
2. Scanty, whitish, thready mucoid discharge.
3. Hyperemia.
4. Photophobia & blepharospasm.
5. Seasonal variation (↑↑ Symptoms in spring & summer).

Signs

1. Types of spring catarrh:
2. Other manifestations:
 - Fine punctate epithelial keratitis.
 - 360 degree corneal pannus may occur.
 - Rarely vernal corneal ulcers.

Differential diagnosis

1. Palpebral type should be differentiated from papillary trachoma.
2. Bulbar type should be differentiated from limbal phlycten.

Treatment

1. Mast cell stabilizers:

- Disodium chromoglycate: Preventing histamine release.
- Lodoxamide.

2. Topical steroids:

- Only in severe unresponsive cases (During acute attacks).
- Should never be used for a long period, as it causes cataract & steroid-induced glaucoma.

3. Symptomatic ttt:

- Dark glasses.
- Cold compresses.
- Vasoconstrictor & antihistaminic eye drops.
- Systemic antihistaminics may help.
- Avoid exposure to allergens if known.

4. Resistant cases: Beta irradiation to the conjunctiva, cryotherapy or even surgery.

3. Giant papillary conjunctivitis

Etiology

- Associated with contact lens wear: ↑↑ risk in extended-wear CL & ↓↓ risk in hard lenses.
- Irritation by ocular prosthesis or exposed corneal sutures.

Symptoms

- **CL intolerance.**
- Irritation, discomfort, burning & foreign body sensation.
- Watery or mucoid **discharge**.
- **Blurred vision** due to mucous coating of the CL.
- **Hyperemia.**

Signs: Giant papillae: Affecting mainly the superior tarsal conjunctiva.

They are large, flat-topped & covered with mucous.

Treatment

- Discontinuation of CL wear (*Symptoms disappear, but the papillae persist for few months*).
- Steroids, antihistaminics, vasoconstrictor, disodium chromoglycate & cold compresses.

Degenerations of the conjunctiva

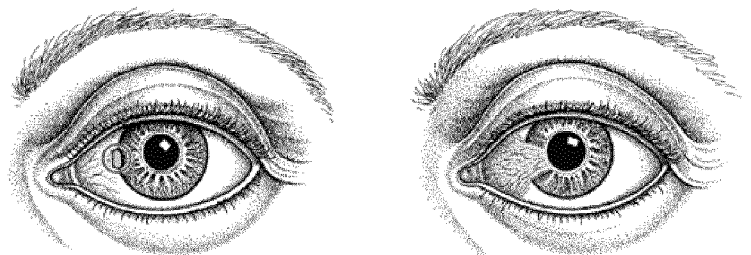
Pinguecula

Definition: Degenerative condition of the conjunctiva, due to the effect of UV rays.

Pathology: Hyaline & elastosis degeneration of the subepithelial conjunctival tissue with elastic tissue deposition.

Clinical picture: Triangular, raised yellowish nodule, with the base towards the cornea. It is usually on the nasal side.

It is non-vascular



Pterygium

Definition: Degenerative process due to chronic irritation by ultraviolet rays, dust, wind or fumes.

Pathology

- Consists of fibrovascular tissue with elastoid degeneration of stromal collagen, covered with a single layer of thick conjunctival epithelium. It creeps on the cornea in a triangular shape. It is usually on the nasal side. It is rarely on the temporal side.
- The pterygium is formed of:
 1. Head: Over the cornea. May grow to cover the pupil (Threatening vision.)
 2. Neck: On the limbus.
 3. Body: On the sclera (Loosely adherent to it.)
- Types of pterygium:
 1. Progressive type:
 - Thick.
 - Vascular.
 - Fleshy.
 - Creeping towards the cornea.
 2. Regressive:
 - Thin.
 - Less vascular.
 - Membranous.

Differential diagnosis: Pseudopterygium:

Treatment: EXCISION

Indications of pterygium excision:

1. Progressive pterygium.
2. Encroaching on the pupillary region.
3. Bad cosmetic appearance.

Operations:

1. Simple excision.
2. Bare sclera technique excision: +/- Beta irradiation.
3. Excision with grafting: Graft either from mucous membrane or conjunctiva.
4. Lamellar keratoplasty if the cornea affected.

N.B. Recurrence is high, especially in re-operation. Beta irradiation decreases the rate of recurrence.